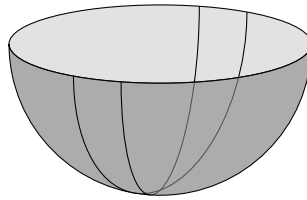


## The Problem Corner

**José A. Vallejo**

Email: [jvallejo@fc.uaslp.mx](mailto:jvallejo@fc.uaslp.mx)

1. Let us consider a simple optimization problem. Given a function of two variables  $z = f(x, y)$ , we can search for its extremal points by intersecting its graph with *vertical* planes, and looking at the resulting curve. Suppose that for each vertical plane passing through the origin, the intersection with the graph of the function is a curve having a minimum at the origin. Is it true that  $f(x, y)$  will have a minimum at the origin? Prove it if you think it is true, or give a counterexample otherwise.



2. A certain sport is played in two halves, and there is the figure of a penalty: a free shot as a consequence of a fault. In analyzing the performance in penalties, the sport section of a newspaper mentions that Team A had a better performance in both halves, so it was overall better. A dissenting reader, Mr. Simpson, writes complaining that the numbers really say that his team (B, of course), was better. Is this possible?